ClearPath Environment

FAS currently owns three Unisys Libra ClearPath 890 mainframe systems. The three ClearPath Libra 890 systems are currently located in two data centers in Eagan, Minnesota (MN) and Salt Lake City, Utah (UT). The GSA production system in the Eagan, MN, hosting location is a ClearPath Libra 890 with two Windows servers. The GSA development system is also a ClearPath Libra 890 mainframe and is hosted in Salt Lake City, UT. The ClearPath Libra 890 in Salt Lake City supports development and testing. The third ClearPath Libra 890 it is configured such that it serves as the Eagan, MN, production business recovery machine.

FAS operates and maintains 13 major mainframe applications supporting FAS fleet, inventory, logistics, and administrative record keeping, control, and reporting requirements. These applications are of varying age, with many being over 20 years old. These applications are typically programmed in Common Business-Oriented Language (COBOL) under Database Management System (DMS) II but also support a variety of other programming languages and utilities.

The Unisys ClearPath Libra mainframe provides a valuable service on which many areas within Federal and state Governments depend. FAS OCIO has a responsibility to continue providing these services even in the event of a major disruption that affects multiple areas of the country.

FAS OCIO will provide all server, peripheral, and network hardware and software needed for ClearPath processing to the contractor as Government-Furnished Property (GFP). FAS currently owns and provides the hardware and systems software. GSA currently outsources (1) ClearPath hosting and operations, (2) management of the EMC Storage array, and (3) VMAX RecoverPoint block-level data replication.

FAS has legacy, mission-critical applications that operate on the Unisys ClearPath mainframe infrastructure, which have capabilities to interface with several Unisys ES7000 enterprise class servers as well as other non-Unisys enterprise servers.

ClearPath hardware measures processing capacity in millions of instructions per second (MIPS). The CIO Office estimates the ClearPath LIBRA 890 hardware platform will process a total of 72,000 MIPS and 60,000 backup MIPS. The breakdown is as follows:

- Production System – 1,000 MIPS/month for 60 months (60,000 MIPS)
- Development/Test System – 400 MIPS/month for 60 months (24,000 MIPS)
- Disaster Recovery System – 1,000 backup MIPS/month for 60 months (60,000 backup MIPS)

ClearPath Environment

Network Environment

Network Environment

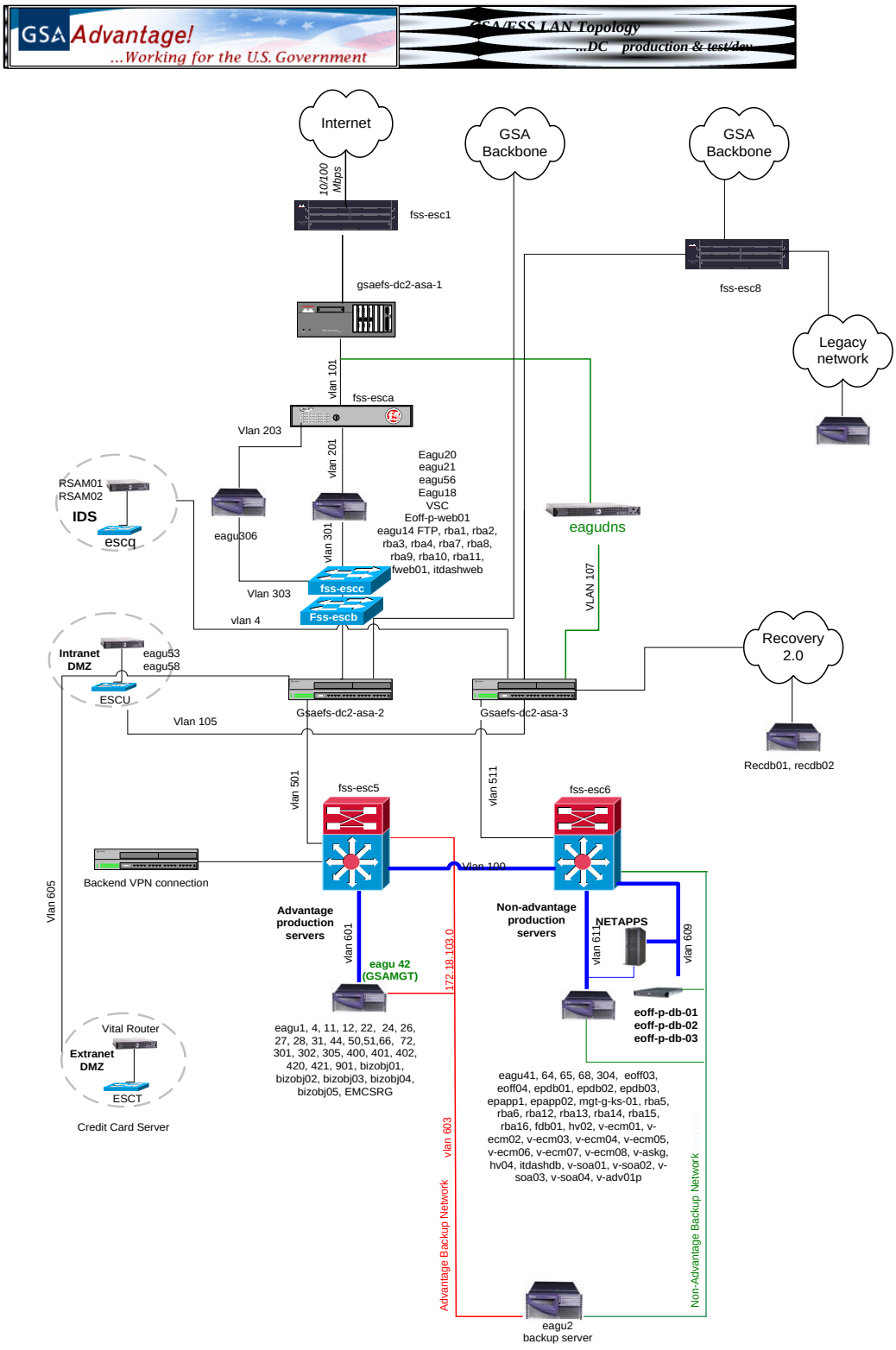
The GSA FAS network environment is structured to facilitate hosting of all of the GSA FAS applications, including but not limited to, GSA Advantage!, E-Offer, RBA and ancillary applications. This environment consists of over 100 production servers that reside at the incumbent hosting provider facilities in Sterling, Virginia and Chicago, Illinois; and, at the GSA hosting facility located at Crystal Plaza IV in Arlington, Virginia.

The network within the GSA FAS environment consists of a VPN tunnel between the Internet Data Centers (IDC) located in Sterling, VA (DC2) and Chicago, IL (CH3). The VPN leverages the incumbent's backbone. This site-to-site VPN is used for database replication, to synchronize the primary site with the COOP site and for other administrative traffic.

Site-to-site VPN tunnels are also used for routing traffic from the Sterling and Chicago data centers back to the GSA backbone. Access to Offeror operated data centers in Sterling and Chicago occurs via these VPN tunnels.

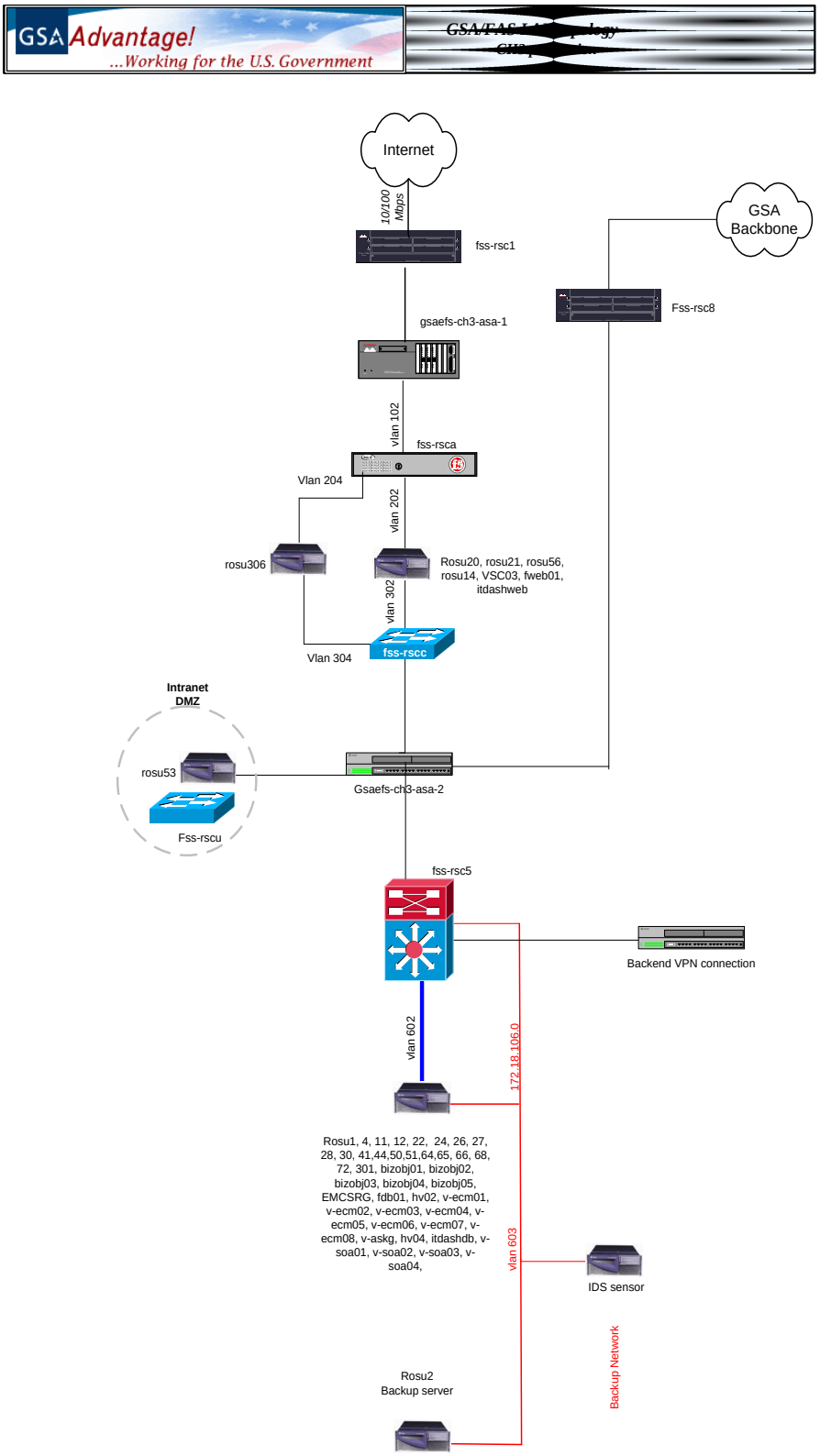
Overall network topology for GSA FAS Sterling (DC2)

Network Environment

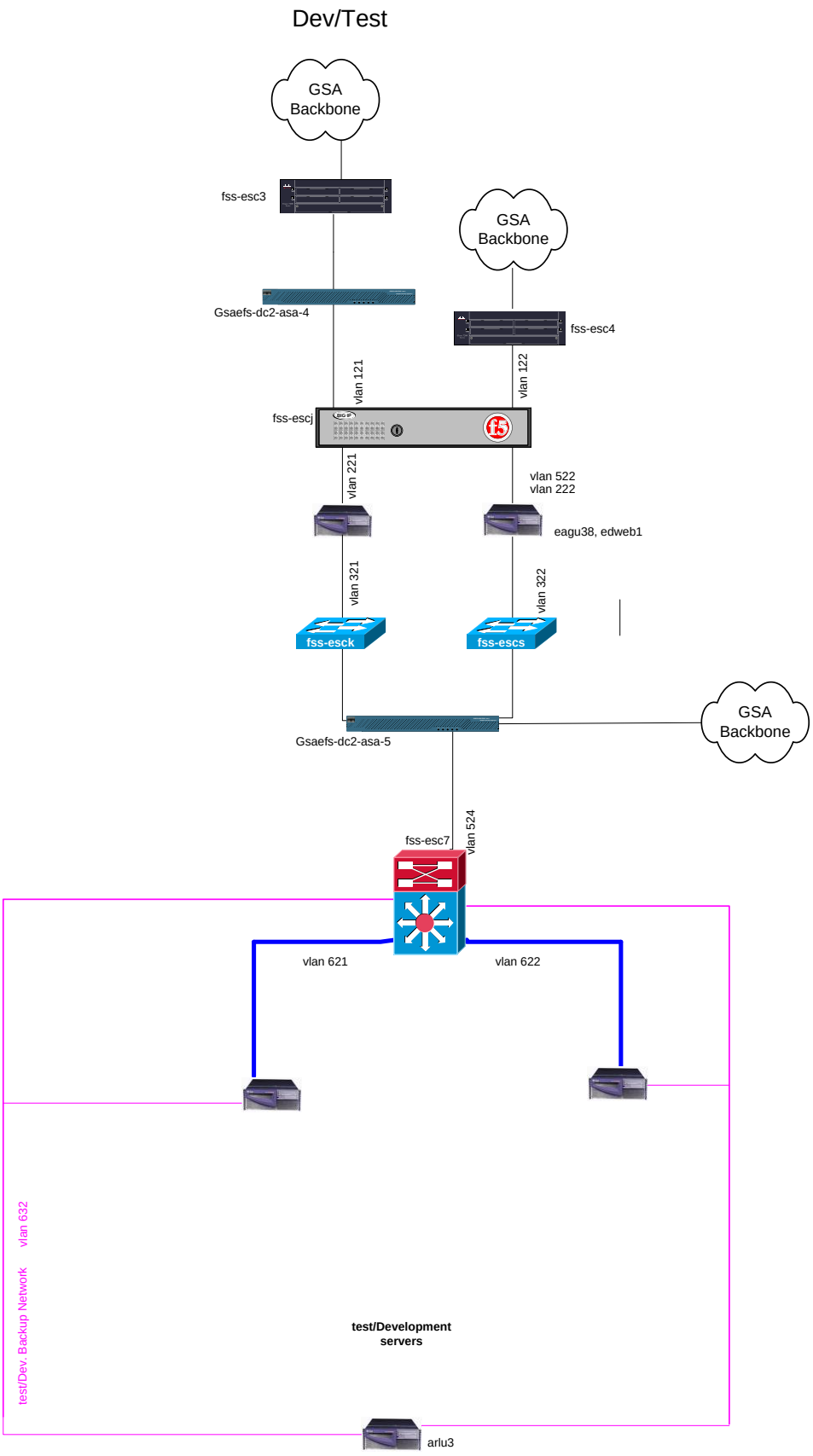


Network Environment

Overall network topology for GSA FAS Chicago (CH3)

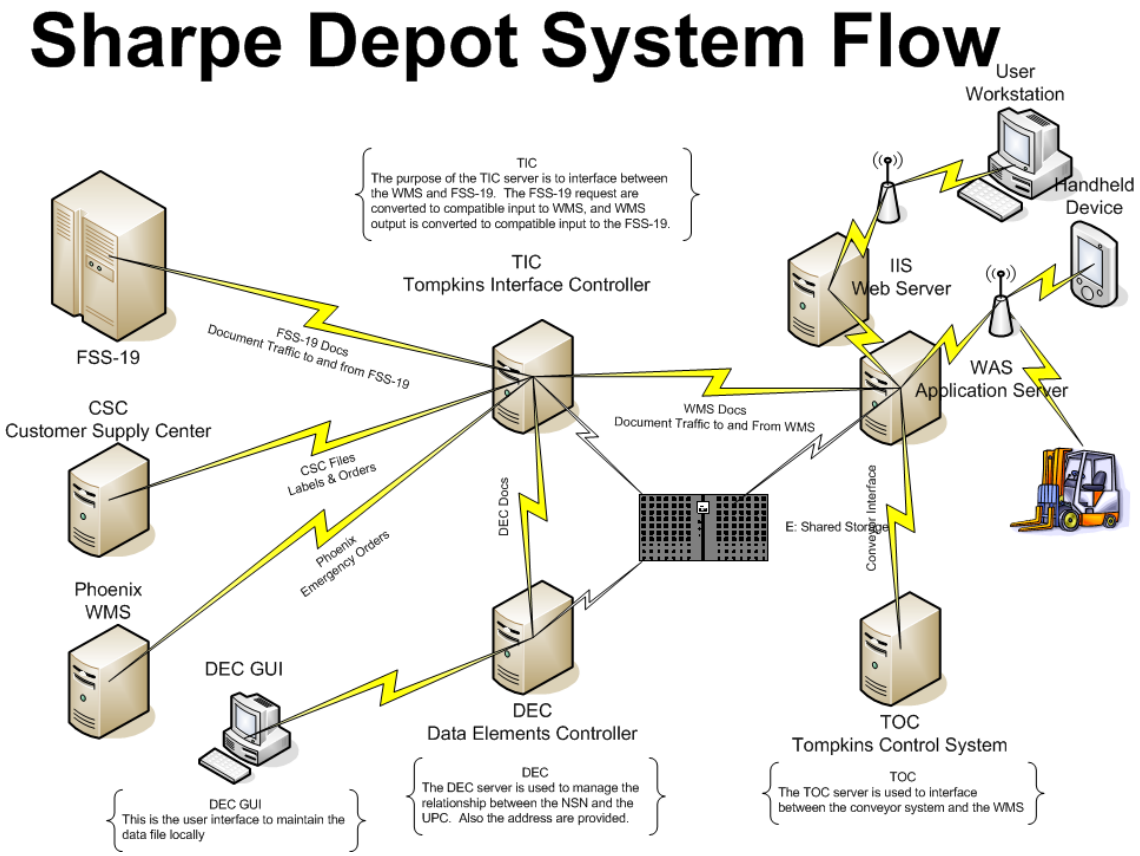


Network Environment



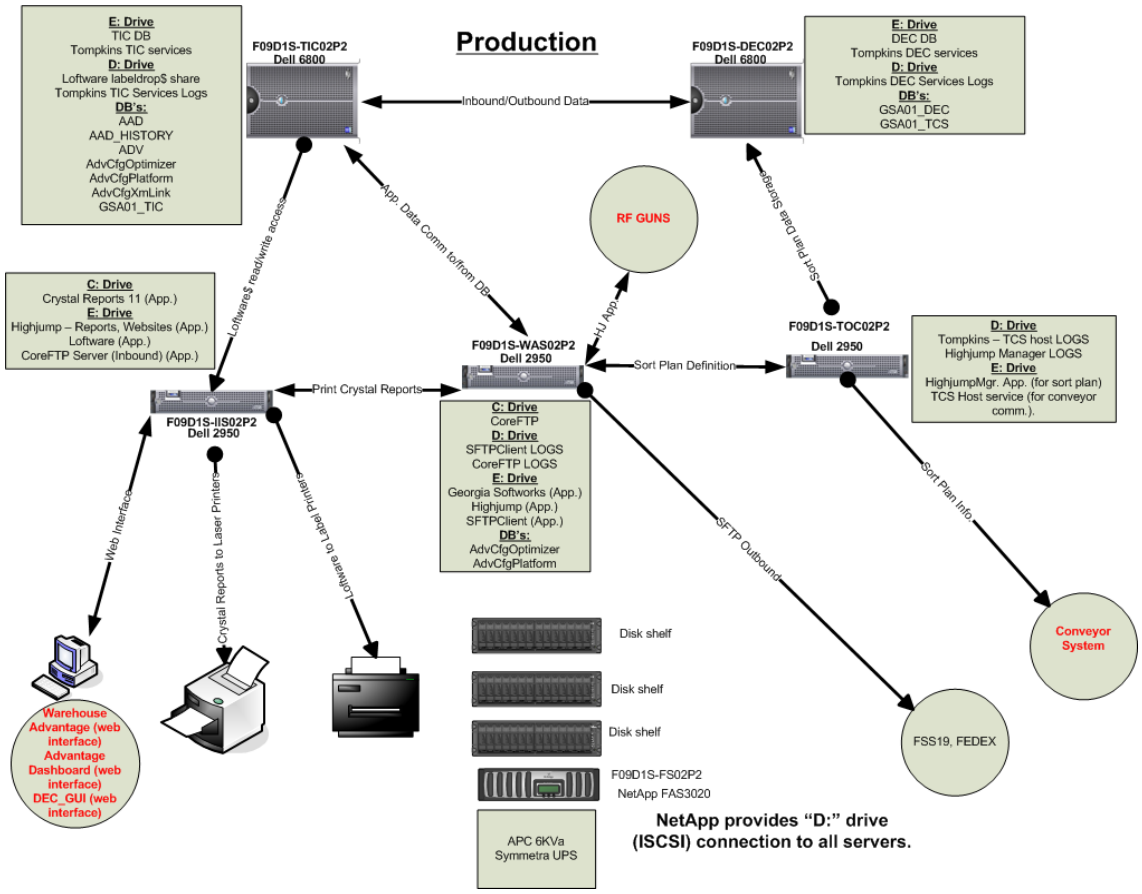
Network Environment

Overall network topology for Sharpe Warehouse



Network Environment

Application Flow



Web Environment

Web Servers

GSA FAS leverages a mix of iPlanet, Apache, and IIS web server instances on Solaris 9 and 10, Linux, Windows and VMware servers. While GSA FAS maintains some instances of IIS, the majority of web servers run on iPlanet and Apache.

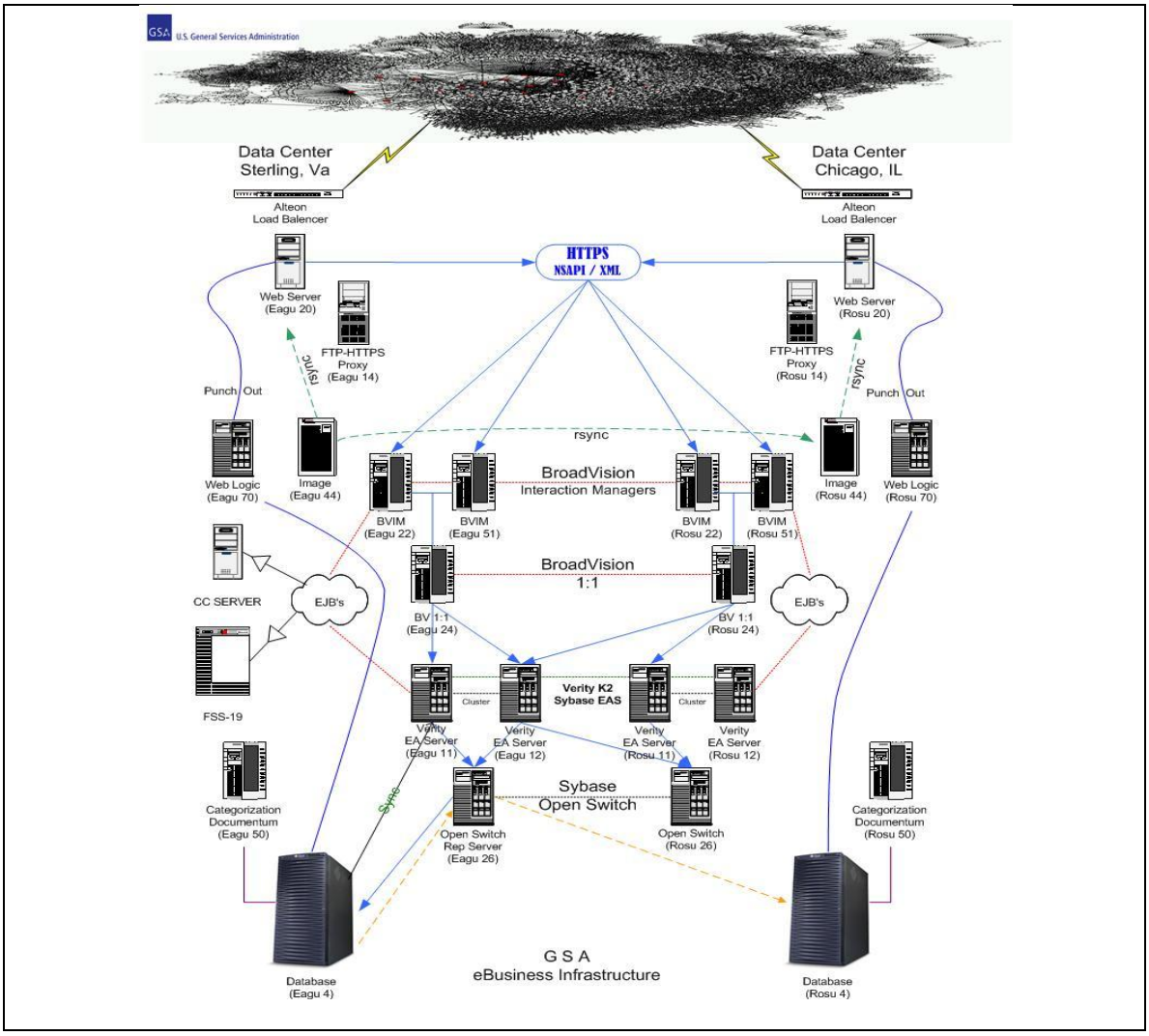
GSA FAS hosts approximately 80 production Apache 2.x instances on multiple separate Apache web servers. This includes web instances at the disaster recovery site, which are generally always active. In addition to the Apache instances, the environment also hosts iPlanet version 6 web servers, primarily used by the GSA Advantage! application. This environment comprises of approximately 40 production iPlanet version 6 web server instances hosted in the same 4 physical servers as the Apache web servers. Twice as many Apache and iPlanet web servers are maintained for the development and test environments.

GSA FAS also leverages the use of an outgoing proxy server for various applications, including the outgoing transmissions to the Internet. GSA FAS has two DMZ based servers running, one in Sterling and an alternate in Chicago. These servers are hosted in the GSA FAS DMZ.

Finally, GSA FAS maintains more than 10 instances of IIS instances on multiple separate servers. These servers are hosted at the Arlington, VA GSA FAS data center and they are also running ColdFusion. The figure below depicts the web server architecture.

Web Environment

GSA Advantage System Design with Web Architecture Depicted



Web Environment

UNIX Hosts

GSA FAS manages and maintains GFE equipment for its open systems infrastructure. GSA FAS use multiple operating systems including Sun Solaris 9, Solaris 10, Linux and VMware. GSA FAS databases have been consolidated onto a Sun M8000 which is configured with Sun Solaris 10 containers. Most of hosts in the GSA FAS infrastructure are configured with Emulex HBAs, are running PowerPath, and are attached to an EMC CX-380 SAN.

Cold Fusion Servers

GSA FAS maintains Cold Fusion 8 instances running on 3 servers. The 2 main servers are INTweb (internal) and EXTweb (external) hosted at CP4. The backend are either MS SQL or Sybase databases. The INTweb has the Intranet with internal applications (ex: conres) and the EXTweb hosts external applications (ex: City Pairs, eResolve). VSC server (hosted at Savvis for production and disaster recovery) runs Cold Fusion, this is where all vendors upload catalogs/images for products, etc. VSC site is SSL.

DNS Servers

GSA FAS administers 4 DNS servers in the following locations, 1 in Sterling, VA and 1 in Chicago, IL, which both are non-authoritative. There are 2 DNS servers in CP4 (Crystal City) which are Authoritative. All 4 DNS servers are running on Linux Operating System on Dell 1750 servers.

F5 Load Balancers

The GSA FAS environment hosts a number of BigIP F5 load balancers. The two primary F5 Production load balancers in this environment are used for the GSA FAS DMZ web server infrastructure. One of these load balancers is hosted in the Sterling, VA location, while the other is located in the Chicago, IL disaster recovery environment. These load balancers are configured to use Global Traffic Manager (GTM) and used for local and geographic load balancing.

These load balancers distribute requests across multiple web servers in the GSA FAS DMZ, primarily for the main GSA Advantage! and eBuy applications. Other GSA FAS applications such as eOffer and RBA are located behind the F5 environment but are not actively load balanced by the F5 appliances. For GSA Advantage! and its ancillary applications, web servers perform as “active” balanced servers in a round robin method.

Active Directory

GSA FAS has an Organizational Unit under the GSA Forest (maintained and administered by GSA OCIO). In the future, GSA FAS would like to move to a more logical and secure Active Directory structure to be able to truly administer OU’s within GSA FAS (instead of the OCIO). Active Directory is currently managed by the GSA Office of the CIO and not GSA FAS.

Web Environment

Backup Infrastructure

GSA FAS currently utilizes dedicated backups servers and tape libraries servicing each network zone. The EMC Networker tool is currently used for enterprise backups. The EMC Networker Backups server solution is currently run on Sun/SPARC hardware (Solaris OS), with Sun LTO-based jukebox libraries. Currently GSA FAS utilizes Iron Mountain for Tape Backup offsite storage. The backup hardware configurations by site are:

- Sterling:
  - SunFire 880
  - StorageTek L700e Tape Library with 324 slots and 12 LTO2 tape drives

- Sterling-DMZ:
  - SunFire v440
  - StorEdge L100 Tape Library with 88 slots and 4 LTO2 tape drives

- Arlington:
  - SunFire v440
  - SUN StorEdge L500 Tape Library with 143 slots and 4 LTO3 tape drives

- Chicago:
  - Sunfire v480
  - SUN StorEdge L500 Tape Library with 237 slots and 10 LTO3 tape drives

- Chicago-DMZ:
  - SunFire v120
  - 4 DLT7000 tape drives

Data Storage Schedule

The schedule for GSA FAS data storage is below:

- Standard - Daily tapes go off-site for 30 days and then tapes are returned and put back into rotation.
- 1-year Off-site - This storage timeframe is for specified hosts/filesystems, often database
- 7-year Off-site - Full snapshot backups are kept offsite for certain hosts
- Forever Off-Site - This requirement applies to certain production backup hosts/savegroups, for Department of Justice retention requirements.
- RBA - 1 month, 1yr for RBA weekly, monthly and annual full backups.

The GSA OCIO is responsible for backing up those Windows hosts that reside on the GSA backbone.